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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/775,702	02/09/2004	Ikuya Yagisawa	16869N-104800US	9171

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EXAMINER

BRADLEY, MATTHEW A

ART UNIT

PAPER NUMBER

2187

DATE MAILED: 01/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/775,702	Applicant(s) YAGISAWA ET AL.	
	Examiner Matthew Bradley	Art Unit 2187	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 November 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 22-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 22-32 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>10/6/05, 11/21/05</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

This Office Action has been issued in response to amendment filed 3 November 2005. Claims 22-32 remain pending and are ready for examination. Applicant's arguments have been carefully and fully considered in light of the instant amendment, but they are not persuasive. Accordingly, this action has been made FINAL.

Information Disclosure Statement

The information disclosure statements (IDS) submitted on 6 October 2005 and 21 November 2005 was filed after the mailing date of the Office Action of 1 August 2005 for application 10/775,702. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the Examiner is considering the information disclosure statement with a signed and initialed copy being attached hereto.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 22-32 are rejected under 35 U.S.C. 102(b) as being anticipated by Matoba (U.S. 5,611,069).

As per independent claim **22**, Matoba teaches,

- a plurality of disks including first type disks configuring a RAID group and at least one second type disk, wherein each of the first type disks store

one of data received from a computer coupled to the storage system or parity data used for recovering the data received from the computer, and wherein the at least one second type disk is used as a spare disk for storing copy data of data stored in one of the first type disks; and (Column 4 lines 4-36) *The Examiner notes that Matoba teaches a mirror disk setup which is constructed to form an array of disks to store data. As shown in Figures 1A and 1B, the system has a plurality of disks that are used for this array construction. Further, parity is taught by Matoba in line 8 with the recitation of "write data from an upper apparatus was striped" and with the usage of RAID3 or RAID5 (Column 6 line 2) parity is inherent.*

- a control section configured to hold an error status of each of the first type disks, start to mirror data between one of the first type disks and the at least one second type disk when the error status of the one of the first type disks matches a predetermined first criterion, (Column 6 lines 4-15). *The Examiner notes that Matoba teaches a "control section" that allows for the "switching" when errors or faults are detected.*
- wherein, after starting to mirror data between the one of the first type disks and the at least one second type disk, the control section is configured to stop mirroring data between the one of the first type disks and the at least one second type disk and start to mirror data between another one of the first type disks and the at least one second type disk, according to the error status of the one of the first type disks and the another one of the

first type disks. (Column 16 lines 18-67). *The Examiner notes that as taught in Column 16 lines 18-67 of Matoba, a fourth embodiment for the invention teaches the switching of present use disks based on an error status. Shown with Figure 18A and 18B, there are ports P0 through P4. These five ports are connected to ranks R0 through R3. Column 16 lines 38-40 of Matoba teach that, "the data reading and writing operations are executed in parallel for the ports P0 to P3 every rank of the disk array."* As taught previously in Matoba and shown in Column 17 lines 36-55, the disks operate as mirror disk units. Since the data writing operations are executed in parallel, the Examiner is interpreting that parallel means the same data is written to at least two disks and is therefore mirroring the data.

- *The Examiner is interpreting the disks P0 through P3 to each be first type disks or second type disks as instantly claimed since mirroring is taking place amongst all drives. The individual distinction between first type disks and second type disks comes, "when the number of errors of either one of the disk units reaches the threshold value and the occurrence of a fault is decided." The disk which triggers this event, or the disk which meets the error status, is labeled as a first type disk. The remaining disks in the rank R0 or any rank, are then interpreted to be at least second type disks. With respect to the switching of first type disks, as taught in Matoba, there is a disk, P4, which is used as a spare disk. As the disk*

exists on the rank in which the disk that the error occurred in, this disk, P4, becomes the 'another one of the first type disks' as instantly claimed since this disk is activated once the error criteria is met. Disk P4 is activated and the operation continues without the first type disk that was in error.

- *Accordingly, Matoba does teach mirroring data between one of a first type disk and the at least one second type disk with disks P0 through P3. Additionally, Matoba teaches that, the control section is configured to stop mirroring data between the one of the first type disks and the at least one second type disk (Column 16 lines 40-45) and to start to mirror data between another one of the first type disks and the at least one second type disk (disks P0 through P3 without the first type disk that was in error and with P4 as 'another one of the first type disks'), according to the error status of the one of the first type disks and the another one of the first type disks (Column 16 lines 40-45).*

As per dependent claim **23**, Matoba teaches, "the control section is configured to compare the error status of each of the first type disks, and based on the result of error status comparison between the one of the first type disks and the another one of the first type disks, the control section is configured to stop mirroring data between the one of the first type disks and the at least one second type disk and start to mirror data between the another one of the first type disks and the at least one second type disk" (Column 6 lines 4-45). *The Examiner notes that as discussed supra in the teachings of*

Matoba, the system of Matoba continuously checks for errors and when errors are abound, the system switches to different disks for writing.

As per dependent claim **24**, Matoba teaches, “when the error status of one of the first type disks matches a predetermined second criterion, the control section is further configured to stop mirroring between the one of the first type disks and the at least one second type disk and configure a RAID group including the at least one second type disk instead of the one first type disks” (Column 6 lines 4-62). *The Examiner notes that as discussed supra, the system switches to a different set of disks for writing upon meeting certain criteria . Additionally, Matoba teaches the ‘second criterion’ of the instant claim with the recitation of “a timing corresponding to the half of the threshold value (column 6 line 55).” This halving of the threshold value represents two values for which the system of Matoba can act upon. Accordingly, the system of Matoba teaches the limitation of “second criterion” by relying on a half of the threshold value instead of the original threshold value.*

As per dependent claim **25**, Matoba teaches, “wherein the error status of each of the first type disks is error count of each of the first type disks, and both of the predetermined first criterion and the predetermined second criterion are predetermined values of error count” (Column 4 line 57 to column 5 line 12).

As per dependent claim **26**, Matoba teaches, “wherein the value of error count for the predetermined first criterion is zero, whereby the control section is configured to mirror data between the one of the first type disks and the at least one second disk initially” (Column 3 lines 38-61). *The Examiner notes that the teachings of Matoba also*

allow for a system that continuously mirrors data. This variation of Matoba omits the error checking subsystem, thus, this variation anticipates the instant claim.

As per dependent claim **27**, Matoba teaches, "wherein the error count for the first criterion is updated according to the change of the error status of the first type disks configuring a RAID group" (Column 12 lines 30-37). *The Examiner notes that the "abnormality counter" of Matoba is "increased by 1" for each error.*

As per dependent claim **28**, Matoba teaches, "wherein the error status of each of the first type disks is error count of each of the first type disks, and when the error count of the another one of the first type disks becomes larger than the error count of the one of the first type disks, the control section is configured to stop mirroring data between the one of the first type disks and the at least one second type disk and start to mirror data between the another one of the first type disks and the at least one second type disk" (Column 16 lines 18-67).

As per dependent claim **29**, Matoba teaches, "wherein information indicating a pair of disks configuring a mirroring pair is output from the storage system to a management computer coupled to the storage system" (Column 11 lines 29-65).

As per dependent claim **30**, Matoba teaches, "wherein the predetermined first criterion is updated based on the error status of the first type disks configuring a RAID group" (Column 12 lines 12-52).

As per dependent claim **31**, Matoba teaches, "wherein the control section is configured to start to mirror data between said another one of the first type disks and the at least one second type disk before a plan of mirroring data between said one of

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the first type disks and the at least one second type disk is completed" (Column 16 lines 40-45). *The Examiner notes that if the error threshold is never met, the disks would be mirrored without interrupting the plan. However, once the threshold is met, the plan is interrupted and the mirroring takes place between another one of the first type disks and the at least one second type disk as discussed supra.*

As per dependent claim 32, Matoba teaches, "wherein the control section is configured to start to mirror data between said another one of the first type disks and the at least one second type disk, if the error status of said another one of the first type disks is greater than or equal to the error status of said one of the first type disks" (Column 16 lines 18-67).

Response to Arguments

Applicant's arguments filed 3 November 2005 have been carefully and fully considered but they are not persuasive.

With respect to applicant's argument located within the fourth full paragraph of the first page of the remarks (numbered as page 5) which recites:

'Matoba does not teach or suggest that, after starting to mirror data between the one of the first type disks and the at least one second type disk, the control section is configured to stop mirroring data between the one of the first type disks and the at least one second type disk, according to the error status of the one of the first type disks and the another one of the first type disks.'

The Examiner respectfully disagrees and refers applicants to the rejection *supra* and the comments *infra*.

The Examiner notes that as taught in Column 16 lines 18-67 of Matoba, a fourth embodiment for the invention teaches the switching of present use disks based on an

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error status. Shown with Figure 18A and 18B, there are ports P0 through P4. These five ports are connected to ranks R0 through R3. Column 16 lines 38-40 of Matoba teach that, "the data reading and writing operations are executed in parallel for the ports P0 to P3 every rank of the disk array." As taught previously in Matoba and shown in Column 17 lines 36-55, the disks operate as mirror disk units. Since the data writing operations are executed in parallel, the Examiner is interpreting that parallel means the same data is written to at least two disks and is therefore mirroring the data.

The Examiner is interpreting the disks P0 through P3 to each be first type disks or second type disks as instantly claimed since mirroring is taking place amongst all drives. The individual distinction between first type disks and second type disks comes, "when the number of errors of either one of the disk units reaches the threshold value and the occurrence of a fault is decided." The disk which triggers this event, or the disk which meets the error status, is labeled as a first type disk. The remaining disks in the rank R0 or any rank, are then interpreted to be at least second type disks. With respect to the switching of first type disks, as taught in Matoba, there is a disk, P4, which is used as a spare disk. As the disk exists on the rank in which the disk that the error occurred in, this disk, P4, becomes the 'another one of the first type disks' as instantly claimed since this disk is activated once the error criteria is met. Disk P4 is activated and the operation continues without the first type disk that was in error.

Accordingly, Matoba does teach mirroring data between one of a first type disk and the at least one second type disk with disks P0 through P3. Additionally, Matoba teaches that, the control section is configured to stop mirroring data between the one of

the first type disks and the at least one second type disk (Column 16 lines 40-45) and to start to mirror data between another one of the first type disks and the at least one second type disk (disks P0 through P3 without the first type disk that was in error and with P4 as 'another one of the first type disks'), according to the error status of the one of the first type disks and the another one of the first type disks (Column 16 lines 40-45).

With respect to applicant's arguments located within the first paragraph of the second page of the remarks (numbered as page 6) which recites:

'Therefore, Matoba discloses switching the present use disk and the spare disk, not switching two present use disks.'

The Examiner respectfully disagrees and refers applicants to the comments and rejection *supra*.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

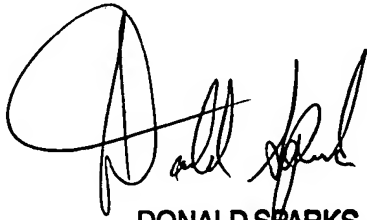
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew Bradley whose telephone number is (571) 272-8575. The examiner can normally be reached on 6:30-3:00 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Donald A. Sparks can be reached on (571) 272-4201. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DAS/mb



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